

Example of documentation of a reasonable search and evaluation for Safe Harbor

- Facility is a metal parts coating job shop located in Brown County
- Significant emission sources include:
 - Two spray booths each with a 1.5 mmBTU/hr natural gas fired drying oven
 - One 18 mmBTU/hr natural gas fired boiler with #2 fuel oil backup

IDENTIFICATION OF APPLICABLE AIR POLLUTION REQUIREMENTS

- Spray booths and drying ovens emit volatile organic compounds, hazardous air pollutants (HAPs), particulate matter and small amounts of sulfur dioxide, nitrogen oxides and carbon monoxide.
- Boiler emits volatile organic compounds, hazardous air pollutants (HAPs), particulate matter, sulfur dioxide, nitrogen oxides and carbon monoxide.
- Reviewed the following documents to find out what emission limits apply:
 - DNR's post-application guidance document
 - SBCAAP's industry specific guidance publications: "VOC RACT Rules for Specific Industries" and "Miscellaneous Metal Parts and Products Coating RACT"
 - SBCAAP's publication "Dust, Smoke, and Fumes – Particulate Matter Emissions"
 - Looked through the titles of each chapter of NR 400 – NR 499 to gauge applicability
- Contacted Tom Coogan of the SBCAAP on 9/30/05 and asked question about RACT rules and whether they apply to our operations
- Determined that spray booths may be subject to a Reasonably Available Control Technology Standard under NR 422 due to VOC emissions
- Determined that spray booths are subject to a particulate matter emission limit under NR 415 due to the particulate matter overspray from the spray guns
- Determined that spray booths may be subject to some state HAP requirements under NR 445 due to HAP emissions from coatings and solvents used in the booths
- Determined that drying ovens may be subject to a particulate matter emission limit under NR 415 because they burn fuel

SPRAY BOOTHS AND DRYING OVENS:

Emission Limits

- Reviewed NR 422 and found that there is a miscellaneous metal parts coating RACT in NR 422.15 which may apply to our operations
 - Facility is located in Brown County and actual VOC emissions exceed the 10 ton/year actual emission exemption level for the RACT
 - We use some cured coatings and some air-dried coatings, so the emission limits that would apply are:
 - For cured coatings, 4.3 pounds of VOC per gallon of coating, excluding water, for clear coatings; 3.5 pounds of VOC per gallon of coating, excluding water, for extreme performance coating; and 3.0 pounds of VOC per gallon of coating for all other coatings.
 - For air-dried coatings, 4.3 pounds of VOC per gallon of coating, excluding water, for clear coatings; and 3.5 pounds of VOC per gallon of coating, excluding water, for all other coatings.
- Reviewed NR 415 and found that NR 415.05 contains particulate matter emission limits for processes
 - Spray booths were installed in 1984, so applicable emission limit is the more restrictive of the direct source limit and the process weight rate equation
 - Direct source limit is 0.40 pounds of particulate matter per 1,000 pounds of exhaust gas
 - Exhaust flow rates of each booth are 3,000 acfm at 72°F
 - Direct source limit is in terms of dry standard cfm, so, converting 3,000 acfm to dscfm yields:
 $3,000 \text{ acfm} * ((460^\circ + 68^\circ) / (460^\circ + 72^\circ)) = 2,977 \text{ dscfm}$
 - Therefore the direct source limit for this process is:
 $0.40 \text{ lb PM} / 1,000 \text{ lb gas} * 2,977 \text{ scfm} * 0.075 \text{ lb gas/scf} * 60 \text{ min/hr} = \underline{5.35 \text{ lb/hr}}$
 - Process weight rate equation limit is $E=3.59P^{0.62}$, where E is the emission limit and P is the maximum hourly process weight rate of the paint booths
 - Maximum hourly process throughput for each booth is 2 tons/hour of parts and 40 pounds of coatings = 2.02 tons/hr
 - Emission limit = $3.59 * (2.02)^{0.62} = \underline{5.55 \text{ lb/hour}}$
 - Direct source limit is the more restrictive, so a particulate matter emission limit of 5.35 pounds per hour applies to each booth.
- Reviewed NR 445 for applicability to spray booths and drying ovens
 - Drying ovens only use group 1 virgin fossil fuels so they are exempt

- Based on the coatings we use, the spray booths can emit toluene, xylene, and formaldehyde
 - Calculated the maximum emissions of each of these pollutants. Only toluene exceeds the NR 445 Table thresholds
 - Applicable limitation is that the off-property concentration of toluene cannot exceed the acceptable ambient concentration of 400 micrograms per cubic meter on an annual basis
- Reviewed NR 415 and found that NR 415.06 contains particulate matter emission limits for fuel burning units
 - Drying ovens are larger than 1 mmBTU/hr, so they are not exempt from the particulate matter emission limits
 - Drying ovens were installed in 1984, are less than 250 mmBTU/hr, and only burn natural gas, so they are subject to a particulate matter emission limit of:
 - 0.15 pounds of particulate matter per mmBTU heat input

Compliance Demonstration and Recordkeeping Requirements:

- Reviewed DNR's post-application guidance and found that there may be recordkeeping requirements in NR 439 to demonstrate compliance with the RACT rules
 - NR 439.04(5) contains recordkeeping requirements for sources subject to the Miscellaneous Metal Parts and Products Coating RACT. Since all of our coatings meet the required emission limits under the RACT, we don't do in-line averaging or another method of demonstrating compliance with the RACT, so NR 439.04(5)(a) contains the records we must keep. The records required are:
 - A unique name or identification number for each coating or ink, as applied;
 - The VOC content of each coating or ink, as applied, in units of pounds of VOC per gallon, excluding water.
- Reviewed NR 439 and did not find any specific records required for the drying ovens
- Will maintain records of usage of materials in the spray booth and fuel usage for the coating oven to show we meet the ROP caps

18 MMBTU/HR NATURAL GAS/#2 FUEL OIL FIRED BOILER:

Emission Limits

- Reviewed NR 415 and found that NR 415.06 contains particulate matter emission limits for fuel burning units
 - The boiler is larger than 1 mmBTU/hr, so it is not exempt from the particulate matter emission limits
 - The boiler was installed in 1984, is less than 250 mmBTU/hr, and only burn natural gas or fuel oil, so it is subject to a particulate matter emission limit of:
 - 0.15 pounds of particulate matter per mmBTU heat input

Compliance Demonstration and Recordkeeping Requirements:

- Reviewed NR 439 and did not find any specific records required for the boiler
- Will maintain the following records to show we meet the ROP caps:
 - Records of fuel usage for the boiler
 - Documentation from fuel oil supplier showing the sulfur content of each batch of fuel oil we receive

DETERMINATION OF COMPLIANCE WITH APPLICABLE AIR POLLUTION REQUIREMENTS

- We determined a realistic maximum coating usage for our spray booths by taking our average actual usage and multiplying it by 3 since we felt we could potentially triple production at maximum capacity.
- We calculated the emission of each pollutant from our drying ovens, spray booths and boiler. We used the emission calculation sheet provided by SBCAAP on their website at <http://commerce.wi.gov/MT-CA-EmissionsWorksheet.xls>. See the attached emission calculation spreadsheet for our facility. We then compared the maximum controlled emissions from each of our emission sources with the applicable emission limits determined above. We are in compliance based on this review.
- We reviewed all of the MSDS for the coatings and solvents we use in our spray booths to ensure that we were meeting the RACT requirements. Based on our reviews, the maximum VOC contents for the coatings we use are:
 - For cured coatings, 3.85 pounds of VOC per gallon of coating, excluding water, for clear coatings; 3.15 pounds of VOC per gallon of coating, excluding water, for extreme performance coating; and 2.05 pounds of VOC per gallon of coating for all other coatings.
 - For air-dried coatings, 4.1 pounds of VOC per gallon of coating, excluding water, for clear coatings; and 2.9 pounds of VOC per gallon of coating, excluding water, for all other coatings.
- We reviewed our records to ensure that we were keeping the necessary records to demonstrate we meet the applicable requirements
- We performed Screen modeling of our toluene emissions to show that the off-site concentration of toluene resulting from our emissions do not exceed the acceptable ambient concentration of 400 micrograms per cubic meter on an annual basis. The input and outputs of the Screen model are attached.

Date of Search and Evaluation: September 30, 2005

Signature: /s/ Dave Minkey